

REMARKS

In the Office Action, claims 1-27 were rejected. By the present response, claims 1, 13, 22 and 29 are amended. Upon entry of the amendments, claims 1-29 will be pending in the present patent application. Reconsideration and allowance of all pending claims are requested.

Renumbering of claims

Applicants respectfully submit that there was an error in the numbering of the claims in the application as filed. The application as filed contains 29 claims with ultimate claim erroneously numbered 27 instead of 29. The numbering of the ultimate claim is now rectified. The ultimate claim is renumbered as claim 29. Applicants would like to bring to the Examiner's kind attention that the discussed below is based on this renumbering.

Rejections Under 35 U.S.C. §112

The Office Action summarizes claims 22-26 as rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner stated that claims 22-26 were vague and indefinite in that the average diameter (particle size) is related to "the smallest element dimension" but the claims does not contain any reference to any element. Thus one cannot determine the metes and bounds of these claims. Applicants respectfully submit that independent claim 22 is amended to recite, *inter alia*, a transducer element of an ultrasonic transducer array. Thus, the independent claim 22 provides antecedent basis for the term "element" referred to in the subsequent dependent claims 23-26.

Rejections Under 35 U.S.C. §103

The Office Action summarizes claims 1-12 as rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 4,373,401 issued to Baumoel. Further, the claims 13-29 were rejected under 35 U.S.C. §103(a) as being unpatentable over W.O. 02/40184A2 issued to Davidsen, in view of Baumoel.

Baumoel does not teach the basing of the particle size of the acoustically attenuative material on the dimensions of the transducer element.

The Examiner stated that Baumoel teaches a piezoelectric element coupled to an acoustic absorbing material. The absorber is a combination of silicone and tungsten particles in an epoxy matrix. The particle size is related to the operating wavelength to give the most efficient damping.

Applicants respectfully submit that the particle sizes of the acoustic scattering material and the acoustic absorbing material as discussed in the present application are based on the element dimensions of the transducer element. For example, a passage cited at page 2, between lines 20–24 discusses the relationship between the particle size of the acoustic scattering and absorbing material and the dimension of the transducer element. The cited passage reads:

In order to maintain acoustic uniformity across the transducer array, each of these small elements must be backed with essentially the same backing material composition. Therefore the particle size of the additives used to adjust the acoustic impedance and attenuation must be significantly smaller than the element size.

As will be appreciated, the attenuation of the acoustic energy by the acoustically attenuative material can be non-uniform if the particle size of the acoustic scattering material and the acoustic absorbing material present in the acoustically attenuative material was only based on the operating wavelength (as taught by Baumoel) and not on the dimensions of the transducer element, as claimed. For example, in case of a particles size of the acoustically attenuative material exceeding that of the transducer element,

some particles may extend to multiple transducer elements thereby resulting in inhomogeneous distribution of particles of acoustic scattering and absorbing material across the plurality of transducer elements. Hence, the particle size of the acoustic scattering and absorbing material, according to the present technique, is smaller than the size of the transducer elements in order to have a substantially homogeneously dispersed acoustic scattering and absorbing material in a matrix. In particular, the claims recite a size that is substantially smaller.

Even in combination Davidsen and Baumoel does not teach a relationship between the particle size of the acoustic scattering and absorbing material and the dimensions of the transducer element.

The Examiner stated that Davidsen :teaches a multi element ultrasonicprobe [sic] arranged in an array backed by a laminate of Baumoel in the Davidsen structures.[sic]” As discussed above, Baumoel fails to disclose any relation between the size of the acoustic scattering and absorbing material and the dimensions of the transducer element. Because neither of the references teaches any relationship between the size of the acoustic scattering and absorbing material and the size of the transducer element, the combination proposed by the Examiner cannot support a *prima facie* case of obviousness.

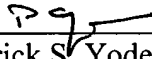
For the reasons summarized above, Applicants respectfully submit that the references relied upon by the Examiner cannot support a *prima facie* case of obviousness. Accordingly, Applicants respectfully submit that independent claim 1, 13, 22 and 29 and claims depending therefrom are allowable and respectfully request the Examiner to reconsider rejection of the claims.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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